What is claimed is:

1. A method for phase characterization of an optical signal under test, comprising:

combining the optical signal under test with at least two pulses of a sequence of optical pulses; and

measuring at least the real and imaginary part of the interference of the optical signal under test with said sequence of optical pulses for each of said at least two optical pulses to determine the phase characteristics of the optical signal under test.

2. The method of claim 1, wherein said combining comprises:

for each pulse of said at least two optical pulses of said sequence of optical pulses:

splitting said optical signal under test;

splitting said sequence of optical pulses;

in a first path, combining said optical signal under test and said sequence of optical pulses; and

in a second path, combining said optical signal under test and said sequence of optical pulses, wherein a relative 90 degree phase shift is imparted between said optical signal under test and said sequence of optical pulses in said second path.

3. The method of claim 1, wherein said measuring comprises:

for each pulse of said at least two optical pulses of said sequence of optical pulses:

in a first path, splitting said combined signals and separately measuring the energy of each of the split signals;

determining the difference between the measured energies of said split signals in said first path;

in a second path, splitting said combined signals and separately measuring the energy of each of the split signals, wherein a relative 90 degree

phase shift is imparted between the combined optical signal under test and the sequence of optical pulses in the second path; and

determining the difference between the measured energies of said split signals in said second path.

4. The method of claim 3, wherein the phase characteristics of said optical signal under test are determined by a method comprising the steps of:

a) for each pulse of said at least two optical pulses of said sequence of optical pulses, combining the determined differences in said first path and said second path to obtain a complex number;

b) considering a subset of said complex numbers; and

c) determining a function of said complex numbers.

5. The method of claim 3, wherein the phase characteristics of said optical signal under test are determined by a method comprising the steps of:

a) for each pulse of said at least two optical pulses of said sequence of optical pulses, combining the determined differences in said first path and said second path to obtain a complex number;

b) determining the phase of said complex number for each of said pulses;

c) determining relative phases between successive determined complex numbers;

d) determining a slow varying function representative of the determined relative phases between successive determined complex numbers; and

e) subtracting said slow varying function from said phases determined in step c) to obtain new relative phase samples.

6. The method of claim 5, wherein said method for determining the phase characteristics of said optical signal under test further comprises the step of:

f) concatenating said new relative phase samples.

7. The method of claim 5, wherein said slow varying function comprises a polynomial fit.

8. An apparatus for phase characterization of an optical signal under test, comprising:

a means for combining the optical signal under test with at least two pulses of a sequence of optical pulses;

a means for measuring at least the real and imaginary part of the interference of the optical signal under test with said sequence of optical pulses for each of said at least two optical pulses; and

a means for receiving the measurements from said measuring means and determining the phase characteristics of the optical signal under test.

9. The apparatus of claim 8, further comprising a means for providing said sequence of optical pulses.

10. The apparatus of claim 8, further comprising a means for synchronizing a sampling rate of said receiving means to the rate of the sequence of optical pulses.

11. The apparatus of claim 8, further comprising a means for filtering said sequence of optical pulses to match a spectral density of said optical signal under test.

12. An apparatus for phase characterization of an optical signal under test, comprising:

a 90 degree hybrid coupler for combining the optical signal under test with at least two pulses of a sequence of optical pulses;

at least two detectors for measuring at least two orthogonal quadratures of the interference of the optical signal under test with said sequence of optical pulses for each of said at least two optical pulses; and

a phase characterization unit for receiving the measurements from said at least two detectors and determining the phase characteristics of the optical signal under test.

13. The apparatus of claim 12, wherein, for each pulse of said at least two pulses of said sequence of optical pulses, said at least two detectors further determine a difference between a measured energy of the optical signal under test and the sequence of optical pulses.

14. The apparatus of claim 12, further comprising a light source for generating said sequence of optical pulses.

15. The apparatus of claim 12, further comprising a detector and a pulser for synchronizing a sampling rate of said phase characterization unit to the rate of the sequence of optical pulses.

16. The apparatus of claim 12, wherein said 90 degree hybrid comprises a voltage controlled thermo-optic phase shifter for imparting a 90 degree phase shift between said optical signal under test and said sequence of optical pulses.

17. The apparatus of claim 12, wherein at least one of said at least two detectors comprises a balanced detector.

18. The apparatus of claim 12, wherein said phase characterization unit determines the phase characteristics of the optical signal under test by performing a method comprising the steps of:

a) for each pulse of said at least two optical pulses of said sequence of optical pulses, combining a real component and an imaginary component of the measurements of said at least two orthogonal quadratures of the interference of the optical signal under test and said sequence of optical pulses to obtain a complex number;

b) determining the phase of said complex number for each of said

pulses;

c) determining relative phases between successive determined complex numbers;

d) determining a slow varying function representative of the determined relative phases between successive determined complex numbers; and

e) subtracting said slow varying function from said phases determined in step c) to obtain new relative phase samples.

19. The apparatus of claim 12, wherein said 90 degree hybrid coupler imparts a 90 degree phase shift to said optical signal under test in a second path relative to a first path.

20. The apparatus of claim 12, wherein said 90 degree hybrid coupler imparts a 90 degree phase shift to said sequence of optical pulses in a second path relative to a first path.

21. The apparatus of claim 20, wherein said 90 degree phase shift is imparted using a voltage controlled thermo-optic phase shifter.

22. A computer-readable medium for storing a set of instructions, which when executed by a processor, perform a method of determining the phase characteristics of an optical signal under test combined with at least two pulses of a sequence of optical pulses, comprising:

a) for each pulse of said at least two optical pulses of said sequence of optical pulses, combining a real component and an imaginary component of an interference of the optical signal under test and said sequence of optical pulses to obtain a complex number;

b) determining the phase of said complex number for each of said pulses;

c) determining relative phases between successive determined complex numbers;

d) determining a slow varying function representative of the determined

relative phases between successive determined complex numbers; and

e) subtracting said slow varying function from said phases determined in step c) to obtain new relative phase samples.